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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,213	03/10/2004	Kunihiko Hayashi	2004_0378A	2393
513	7590	01/16/2008	EXAMINER	
WENDEROTH, LIND & PONACK, L.L.P.			WILSER, MICHAEL P	
2033 K STREET N. W.			ART UNIT	PAPER NUMBER
SUITE 800			2195	
WASHINGTON, DC 20006-1021				
MAIL DATE		DELIVERY MODE		
01/16/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/796,213	HAYASHI, KUNIHIKO
Examiner	Art Unit	
Michael Wilser	2195	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 10 March 2004.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-16 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-16 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 10 March 2004 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 - Certified copies of the priority documents have been received in Application No. _____.
 - Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 5/11/04 & 11/7/07.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

DETAILED ACTION

1. Claims 1-16 are pending in this application.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 18 in Figure 1 and 18 in Figure 14. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A. The following claim language is vague or indefinite:

(i) As per Claim 1, line 2 recites "switching time slots". It is unclear as to what the applicant means by "switching time slots". In computers when a time slot expires the computer goes to the next time slot and executes the tasks assigned to that slot, therefore it is switching time slots so it is unclear as to why the applicant is referring to the task switching being done by the time slots.

(ii) As per Claim 1, line 6 recited "specified time slot". It is unclear as to what the applicant considers a "specified time slot". Is the specified time slot a different type of time slot than a normal time slot or what makes this time slot different? Do type A tasks

have to be assigned to a "specified" time to run? How does a type A task run at an unspecified time? If the type A tasks are time critical or processor performance critical they would need to have a processing time specified otherwise they might be starved.

(iii) As per Claim 1, lines 8-9 recited "switched to a time slot other than the specified time slot". It is unclear on how one would switch to a time other than the next specified task. How does the system know what task is to be run in the next time slot if it is not specified? Even if the system moves to the next time slot after the slot that has just finished wouldn't that be the next specified time slot?

(iv) As per Claims 9, 15, and 16, they are lacking for the same reasons as Claim 1 above.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claim 16 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 16 is directed to a program, however for a program to be statutory subject matter it has to be stored on a computer-storage medium and executed by a computer. Therefore, Claim 16 is non-statutory since it claims the steps of the program but no storage medium for the program.

7. In, addition, the body of the claims seem to be "method steps" claim. It is uncertain whether this is a program or a method claim.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-5, 8-12, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over D'Souza (US 6,052,707) in view of Shibayama et al. (US 2004/0064817).

10. As per Claim 1, D'Souza teaches the invention substantially as claimed including a task switching apparatus for switching execution of a task assigned to a time slot (column 2, lines 29-33) comprising:

- a. an assigning unit operable to assign each of a plurality of first type tasks (I/O) to a single time slot and a plurality of second type tasks (application) to a single time slot (abstract, line 3 & column 4, lines 32-36);
- b. a tasks selecting unit operable to select a first type tasks assigned to the time slot and to select a second type tasks from the plurality of second type tasks when the time slot is switched (column 4, lines 63-66); and
- c. running a B type task in a specified time slot (column 4, lines 47-52).

11. However, D'Souza does not explicitly disclose that the tasks are switched by switching time slots. However, Shibayama discloses a system in which tasks are switched by switching time slots (page 7, paragraphs 117 & 118).

12. It would have been obvious to one of ordinary skill in the art at the time of the invention to have switched tasks in D'Souza's invention using Shibayama's system. One would have been motivated to swap the time slot since the tasks are already scheduled for a determined amount of time and by starting a new time it becomes easier to calculate the remaining time in the time slot for other tasks to execute.

13. As per Claim 2, D'Souza further discloses wherein the second type tasks has a priority and the tasks selecting unit selects a second task from the plurality of second type tasks according to priorities (column 5, lines 3-10).

14. As per Claim 3, Shibayama further discloses wherein the assigning unit determines time of the specified time slot which is residual time obtained by subtracting total time of time slots to which the plurality of first type tasks are assigned from time of a predetermined period (page 4, paragraph 58).

15. As per Claim 4, Shibayama further discloses wherein the assigning unit recalculates the residual time so as to determine it as the time of the specified time slot every time it assigns a new first type task to a time slot (page 4, paragraph 59).

16. As per Claim 5, D'Souza further discloses wherein the first type tasks is a tasks with specification of assignment time and when trying to add a new first type task refusing to assign time slot to a new first type task if assignment time exceeds time for a period (page 3, paragraph 36).

17. As per Claim 8, D'Souza further discloses a switching unit operable to prepare one of the register sets for using it for a task under execution, return the context of a task to be completed next to another register set using background processing and switch register sets when switching time slots (column 6, lines 16-35).

18. As per Claim 9 D'Souza discloses the invention substantially as claimed including a task switching apparatus for switching tasks to be completed in a processor (column 1, lines 12-14) comprising:

- a. a first generating unit operable to assign a single time slot to each first type task whose assignment time is specified and generate time slot information including assignment time of each task corresponding to each of the time slots (column 4, lines 46-52);
- b. a second generating unit operable to assign a plurality of second type tasks with a priority to a single specified time slot and generate a single piece of time slot information including assignment time and a priority of the specified time slot (column 4, lines 46-52);
- c. a third generating unit operable to generate the task management information including an address of each of tasks assigned to a time slot (column 5, lines 24-45);
- d. a storing unit operable to store the generated time slot information and task management information being associated with each other (column 5, lines 24-45);
- e. a selecting unit operable to select time slot information stored in the storing unit at least once in a period (column 5, lines 1-15); and
- f. a control unit operable to allow an execution of a task indicating task management information corresponding to the time slot information when time slot information to which a first type task is assigned is selected, select a task from a plurality of pieces of task management information corresponding to the time slot

information according to priorities and allow an execution of the task indicated by the selected task management information when time slot information to which a second type task is assigned is selected (Figure 8).

19. As per Claim 10, D'Souza further discloses wherein the storing unit stores pieces of task management information of second type tasks as a queue in which the pieces of task management information are aligned in priority order, the control unit selects tasks corresponding to leading task management information of the queue (column 5, lines 3-10).
20. As per Claim 11, D'Souza further discloses wherein the second generating unit sets difference between the period and total assignment time of all first type tasks in the specified time slot information as assignment time of the specified time slot (column 4, lines 47-52).
21. As per Claim 12, Shibayama further discloses wherein the second generating unit recalculates the residual time so as to determine assignment time of the specified time slot every time first generating unit assigns a time slot to a new first type time slot (page 4, paragraph 59).
22. As per Claims 15 and 16, they are rejected for the same reason as Claim 1 above.

23. Claims 6 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over D'Souza (US 6,052,707) and Shibayama et al. (US 2004/0064817) as applied to claims 1 and 12 above, and in further view of Goldick (US 2003/0093457).
24. As per Claim 6, D'Souza and Shibayama do not explicitly disclose of a storing unit capable to store lock information showing whether a resource capable of being accessed by a tasks is in a lock state because of access by any tasks or not. However, Goldick disclose an apparatus that does store lock state information for resources (page 2, paragraph 12).
25. It would have been obvious to one of ordinary skill in the art at the time of invention to have stored lock state information in D'Souza and Shibayama's invention. One would have been motivated to store lock information since it is common in multi-tasking systems to have a tasks request a resource that is locked and instead of spinning on that tasks to place the task in a queue until the lock is free and then reactivating the waiting task.
26. And, Goldick further discloses a changing unit operable to change a state of a task from an executable state to a waiting state when the task under execution is trying to access a resource in a lock state and change a state of the task from a waiting state

to an executable state when the resource is unlocked, and wherein the task selecting unit eliminates a task in a waiting state from selecting targets page 2, paragraph 20 & page 9, paragraph 84).

27. As per Claim 13, it is rejected for the same reason as Claim 6 above.

28. Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over D'Souza (US 6,052,707), Shibayama et al. (US 2004/0064817), and Goldick (US 2003/0093457) as applied to claims 6 and 13 above, and further in view of Hoogerbrugge (US 2006/0069738).

29. As per Claim 7, D'Souza Shibayama, and Goldick do not disclose of a shifting unit operable to shift the processor to a power-saving state when no tasks is included in first type and second type tasks. However, Hoogerbrugge discloses an apparatus that does switch to a power-saving state when no tasks are available (abstract, lines 8-19).

30. It would have been obvious to one of ordinary skill in the art at the time of invention to shift to a power-saving mode in D'Souza, Shibayama, and Goldick's invention. One would have been motivated to switch to a power-saving mode so that since the processor is not being used it can save on the overall drain on the system therefore freeing more resources for other computing functions.

31. As per Claim 14, it is rejected for the same reason as Claim 7 above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Wilser whose telephone number is (571) 270-1689. The examiner can normally be reached on Mon-Fri 7:30-5:00 EST (Alt Fridays Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


MPW
December 14, 2007


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